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ABSTRACT

This newsletter discusses the disappearance of the world's forests and the resulting environmental problems of erosion and flooding; loss of genetic diversity; climatic changes such as less rainfall, and intensifying of the greenhouse effect; and displacement and destruction of indigenous cultures. The articles, lessons, and activities are organized in six sections that discuss: (1) the causes of deforestation and its relationship to the problems of erosion, the greenhouse effect and amounts of rainfall are discussed; (2) information about the biological and medical value of the tropical rain forest and why it is being destroyed; (3) two case studies on the destruction of the tropical rain forests in Nicaragua and the Solomon Islands; (4) the logging industry in British Columbia; (5) potential solutions to the problem; and (6) five activities in which students graph areas of tropical rainforest, discuss the fate of the rainforest, write about the effects of deforestation, consider sustainable development and draw conclusions from the case studies. Lists of audio-visual and organizational resources are included. (MDH)

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Forests & Trees

Teachergram Vol. 2, No. 3 Spring 1989

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teaching global issues

Teachergram

Vol. 2, No. 3 Spring 1989

Forests & Trees

To the teacher

The disappearance of the world's forests is leading to a host of environmental problems, of both local and global proportions:

- erosion and flooding;
- loss of genetic diversity;
- climatic changes — less rainfall, an intensifying of the greenhouse effect;
- displacement and destruction of indigenous cultures.

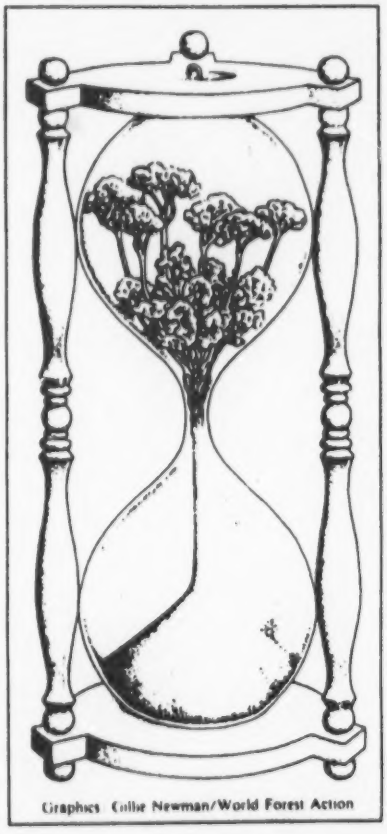
Why do people and nations persist in destroying their trees and forests? Land pressures, the activities of large multinational logging companies, and national debt all contribute to a situation where people acting out of short-term necessity destroy their future.

In this issue of ***Teachergram***, students are encouraged to understand the causes of, and examine possible solutions to, a problem which affects both British Columbians and Third World citizens.

"From outer space some years ago, astronauts could see only one sign of [human] activities on earth — the Great Wall of China.

Three things are now visible: The Great Wall of China, burning forests in Brazil and clear-cut logging in B.C."

(Father Charles Brandt, "Astronauts See Logging" ***Courtenay-Comox Valley Record***, Feb1/89)



Graphics Collie Newman/World Forest Action

The world's trees are disappearing — and fast. The world's forests, which cover about one-third of the world's land area, are losing ground at the rate of 15 million hectares a year. At the present rate of deforestation, about 40% of the remaining forest cover in the developing countries will be lost by 2,000 A.D. In the tropics, 10 trees are being cut for every one planted.

Canadians are beginning to realize that *their* forests are also threatened. In March 1988, Canada's auditor-general pointed out that logging in Canada is proceeding at an unsustainable rate.

Don McNair, Westcoast Development Group

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Deforestation: Why the Fuss?

◆ **Erosion:** When you remove the roots, which anchor the earth, the canopies which protect it from wind and torrential rains, and leaves, which nourish it, you've set the scene for erosion. Trees also act like a sponge, absorbing the water when it rains, and releasing it slowly. When the trees are no longer there, rainwater washes down slopes, carrying with it precious soil. Not only is the soil's fertility lost, but the likelihood of flooding is increased.

Nepal:

Since1953, when Nepal's most famous mountain, Everest, was first ascended, about half of Nepal's forest has been cut down. Now that the trees which used to bind the soil to the mountainsides have gone, the rains wash almost 5 tonnes of soil a year from every hectare of the bare slopes.

As the soil goes, crops fail. Rice yields in the Nepalese hills have dropped by one-fifth in the last five years, maize yields by a third, and 60 percent of the children suffer from malnutrition.

Meanwhile, the soil continues on down the Ganges river, raising the water levels by 15 to 30 cm. a year. Floods are on the increase, all the way to Bangladesh. In 1978 alone, 65,712 villages were flooded. *(Source: **Paradise Lost? Earthlife Foundation, 1986**)*

◆ **The Greenhouse Effect:** CO_2 levels in the atmosphere have increased by about 30% from 1850 to 1980—and are projected to leap a further 75% by 2060. Carbon dioxide traps heat from the sun and prevents it from radiating back into space. This creates the "greenhouse effect" — a gradual rise in the temperature of Earth's atmosphere, which could dramatically alter global weather patterns, melt the edges of the polar ice caps and cause the flooding of coastal areas and cities. (Source: Myers, N. et. al. ***Gaia , An Atlas of Planet Management***. NY: Anchor Books, 1984)

◆ **Rainfall:** Scientists are still trying to figure out the exact relationship between deforestation and drought. It seems that when forested land is cleared, more solar energy is reflected back from the cleared surface, and this energy interferes with the build-up of rain clouds. Studies in Brazil show that most of the rain that falls in the interior is moisture recycled, by transpiration and evaporation, from trees closer to the coasts. Scientists are now hypothesizing that the destruction of West Africa's forests may be largely responsible for the increasing pattern of drought in the Sahel and Ethiopia. (Source: Harrison, P., ***The Greening of Africa***. London: Paladin, 1987; ***Ecologist*** Vol 17, No 4/5 1987)

◆ **Losing Genes:** To all of the above, add the loss of genetic diversity resulting from rainforest destruction (see page 3), and you have a pretty grim picture!

What can trees do about the Greenhouse Effect?

The Carbon Trap

You probably already know a lot about this tree: it holds in soil, absorbs water, and provides shade, wood, fodder, fertilizer, medicine, and food.

What you may not know is that this tree also acts as a "carbon trap". The earth's vegetation and soils store roughly triple the amount of carbon held in the atmosphere. When cleared or burned, forests release much of their carbon, adding to the greenhouse effect. Scientists estimate that in 1988, deforestation accounted for about one-fifth of the total CO_2 build-up. (Source: Lester Brown et al, ***State of the World 1989***, Norton: Worldwatch, 1989)

(Alternatives 1975)

The Causes:

The causes of deforestation are many. Commercial logging, coupled with the need for agricultural land, are two major causes. (See ***The Rainforest***, pages 3-4). Another major cause, which particularly affects open woodland and shrubland, is the search for fuelwood.

A Burning Question: The Fuelwood Crisis

The problem of deforestation exists not only in forests, but in open woodlands, where trees are hacked down by women seeking fuel to cook food for their families. The search for fuelwood becomes more difficult each year, as areas surrounding population centres become overcut.

Almost half of the world's wood is used as fuel, and over 80% of the fuelwood is used by developing countries. A UN study completed in 1983 found that more than 100 million people in 26 countries were suffering from an 'acute scarcity' of wood while nearly 1.3 billion people were in a 'deficit situation', forcing them to cut wood faster than it is being replaced. If present trends continues, by the year 2000, 2.4 billion people—over half the population of the developing world—will be short of fuelwood.

What solutions can you see to the fuelwood crisis? (think of both supply and demand)

The Rainforest

The equivalent of more than 20 football fields of tropical forest are destroyed every minute, 620 square kilometres every day. Each year, an area the size of Great Britain [about one-quarter the size of B.C.] is lost.

(Source: ***Globe and Mail***, April 23/88, "Everyone's loss")

Tropical forests cover only 7 percent of the earth's surface, but they house between 50 and 80 percent of the planet's species. When huge tracts of rainforest are felled to provide hardwood for the so-called "developed" world, or land for the farmers, the world loses not just trees, it loses something called ***genetic diversity***. As in the case of that now-famous extinct species, the Dodo, once a species is gone, it's gone. That might not sound too serious, until you realize that we all depend on the species found in tropical rainforests. 25% of the pharmaceuticals which we use today contain ingredients originally derived from tropical wild plants.

★ In 1960, 4 children out of every 5 who got leukemia died. Now 4 out of every 5 survive. The miracle? A substance from a forest plant called rosy periwinkle, which grows in the jungles of Madagascar. Ninety-five percent of Madagascar's jungles are now gone. (Source: Timberlake, L. ***Africa in Crisis***. Earthscan, 1985)

★ In the search for a cure for AIDS, Daniel Janzen, University of Pennsylvania biologist, looks to the rainforest:
"I know of three plants with the potential to treat AIDS. One grows in an Australian rainforest, one in Panama and one in Costa Rica." (Linden, E. "The Death of Birth", ***Time***, Jan. 2/89, pages 26-33)

Indonesia: A resettlement scheme moves millions of landless peasants from the crowded island of Java to the islands of Sumatra and Sulawezi. These islands, once heavily forested, have been denuded for agriculture and fuelwood. 3.3 million hectares of tropical forest are threatened. Most of the soil, when laid bare, becomes infertile and can support agriculture for only a few years.

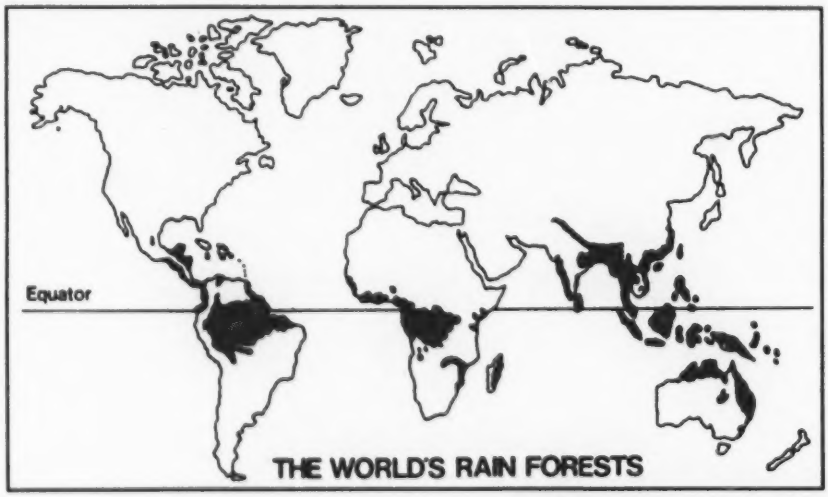
The Philippines: Since 1960, 55 percent of the rainforest of the Philippines has been destroyed by industrial logging. Technically, the companies are required to replace the trees cut down. In practice, a 1975 survey found that only 17 percent of logging companies made any attempt to reforest. The government estimates that by the end of the century, all the remaining primary rainforest will be logged.

Panama: The watershed of the Panama Canal is rapidly being deforested for ranching. The result? More hamburgers for North Americans, but less water for the Panama Canal. The lakes and reservoirs which supply the Canal's lock system with water are rapidly silting up as soil rushes down the denuded slopes. In addition, the cleared ground reflects more solar energy than does forested ground, and this interferes with the build-up of rainclouds. Thus, each year, the Canal receives less rainfall. The clearance of land by ranchers is partially financed by the World Bank, to which Canada is a contributor.

As well, the health and adaptability of our crops are sometimes dependent on the genetic material contained in the rainforest.

★ In the 1920s, when disease decimated the sugar-cane crop in the southern United States, genes from a wild species in Javan forests saved the industry from ruin. (Source: ***Paradise Lost?*** Earthlife Foundation, 1986))

★ In Canada . . . four varieties of wheat produce 75 percent of the crop grown on the Prairies and more than half of it comes from a single variety: the Neepawa, whose breeding was made possible through tropical forest germplasm. (Source: CIDA, ***Development***, June 1986)



New Internationalist, October 1985

Why Are They Destroying Their Rainforests?

If we look at the examples on page 3, we can see the reasons why people cut down rainforest:

♦ **Logging** destroys about 5 million hectares of tropical forest each year. For every 10 hectares of trees destroyed, one is replanted. Logging tropical hardwood is a profitable business, netting about $8 billion a year in total trade.

Who gets the wood? Most is exported to Japan, Western Europe and North America. Canada imported 25,000 cubic meters of tropical wood products in 1986, most of it used for furniture and construction. Canada's main source of tropical timber, Indonesia, is losing its rainforest at the rate of 200,000 hectares each year. **The developed world's imports of hardwood have multiplied 16 times since 1950 whilst the amount of wood used by tropical regions has only tripled.**

Logging destroys rainforests directly by felling trees, and indirectly by building roads into areas which were once inaccessible. With roads come settlers.

(Source: Friends of the Earth)

♦ **Farming** eats up huge quantities of rainforest. The fragile rainforest floor, once cleared, is not fertile land. After two or three years of cultivation it becomes eroded and exhausted. The settler then heads out on another logging road to begin a new cycle of destruction. Why do they do it? Essentially, they have no choice. The 250 million people who are busy this minute destroying the rainforest have no jobs, no land, and no other way to support their families. Part of this is because of rapid population growth. Part of it is because of the unequal distribution of land. In Latin America, 93 percent of farmland is controlled by 7 percent of the people; in Java, one percent of farmers own 33 percent of the land. The others get pushed into the rainforest, to live as best they can. Countries like Brazil and Indonesia are actively promoting schemes to send large numbers of people to farm the rainforest. From a political point of view, it's a safer solution than promoting land reform. From an environmental point of view, it's disastrous.

♦ **Development projects** — massive mining projects, dams which flood hundreds of hectares of forest — also affect the rainforest. Brazil's Tucurui Dam, the fourth largest in the world, drowned 2072 sq. km. of rainforest — an area about two-thirds the size of Vancouver Island.

People of the Rainforest

The rainforests are inhabited by groups of indigenous people, who have learned to live in harmony with their surroundings through careful farming techniques, hunting and gathering. There are about 1,000 different forest tribes around the world. As the forest is cleared, and loggers and settlers arrive, stories of atrocities are common. Forest people have been shot, bombed, poisoned, deliberately infected with diseases and driven from their homes in the drive for "development". Tribal people are beginning to rebel. In Sarawak in East Malaysia, thousands of indigenous people have formed human barricades across logging tracks in a bid to stop the destruction of their lands by timber companies. They claim that the timber companies have no right to build roads, destroy their forests, and pollute their water supplies.

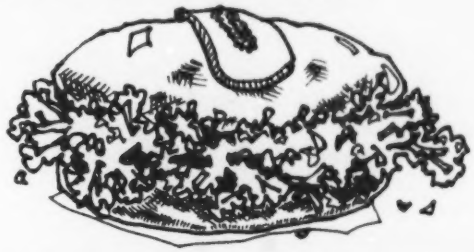
(T. Apin, "The Sarawak Timber Blockade," ***The Ecologist***, Vol. 17 no 4/5, 1987)

"Development for Whom?"

"Some people say we are against "development" if we do not agree to move out of our land and forest. This completely misrepresents our position. "Development" does not mean stealing our land and forest away from us. This is not development but theft of our land, our rights and cultural identity."

(From a Statement signed by 61 tribal leaders on behalf of 27 communities of indigenous people in Sarawak, Malaysia. In April, 1987, 42 tribal people were arrested for their part in the blockade against logging roads in their forest. In January 1989, 127 more were arrested. Quoted in Apin, ibid.)

The Killer Hamburger



The "Burger Bonanza" has been a major rainforest killer. One-quarter of Central America's rainforest is now planted in grass to feed cattle. Who gets the beef? North American burger chains. A hectare of rainforest sustains about 800,000 kilos of plants and animals. Turned to grazing land, that same hectare will produce 200 kilos of meat a year, or 1,600 hamburgers. The real price of one hamburger is half a tonne of rainforest, or nine square metres of irreplaceable pristine rainforest. (***New Internationalist***, July 1987)

Illustrations: Don McNair, Westcoast Development Group

Nicaragua's Battle for Forests: *Fighting on Two Fronts*

July 19, 1979: After a massive national struggle, the people of Nicaragua overthrow the dictator Anastasio Somoza. Three days later, Nicaraguan environmentalists propose to the new Sandinista government that a Ministry of Natural Resources—the first in Nicaraguan history—be formed. **IRENA** (the Nicaraguan Institute of Natural Resources and the Environment) is begun.

What forestry problems did IRENA find?

★ **Rainforests:** Because land ownership was so unequal under Somoza's regime (1% of the population controlled 50% of the land; Somoza himself owned 20% of Nicaragua's prime farmland), landless peasants had been forced to cultivate land on the edge of the rainforest. When this quickly became unproductive, the families abandoned the land to cattle ranchers, and moved deeper into the rainforest. Cattle ranching became big business. During the 1970s, Nicaragua was the top Latin American beef supplier to the U.S. and 30% of Nicaragua's tropical rainforests disappeared. As well, pine forests—logged by large, foreign-owned timber companies—had not been reforested.

★ **Fuelwood:** Like most developing countries, Nicaragua used a lot of wood for fuel. Over 90% of household fuel, and 25% of industrial fuel was wood.

What did the new Nicaraguan government do?

☆ **Rainforest:** Land reform has meant that Nicaraguans no longer have to cultivate rainforest land. Rainforest cultivation has been limited to some subsistence agriculture, and to environmentally sustainable crops such as coconut and cocoa.

☆ **Reforestation:** Nurseries throughout the country grew 2 million trees annually for reforestation projects until 1986, when progress was slowed down by war.

(*New Internationalist*, April 1982)

☆ **Parkland:** In 1983, IRENA targeted 18% of Nicaragua's territory for national parklands. This would give Nicaragua one of the highest percentages of parklands in the world. (B.C.'s parklands constitute 5% of our total territory.)

☆ **Fuelwood:** Nicaragua's Ministry of Energy is developing geothermal and small- to medium-sized hydroelectric power projects, as well as studying sources such as wind and solar power.

WAR: The Greatest Environmental Threat

Nicaragua, while it struggles to create greater sustainability for the environment, is fighting a vicious war on its borders. The US-backed ***contras***, who are fighting to destabilize the Nicaraguan government, have made environmentalists and environmental projects prime targets. More than 50 employees of IRENA and the State Forestry Corporation have been killed, and scores more kidnapped. In April 1987 Ben Linder, a young engineer from Seattle, was killed by the *contras* as he worked on a small-scale hydroelectric project, attempting to reduce Nicaragua's dependence on fuelwood. The tree nurseries and reforestation projects have been targeted by the *contras*. In 1983, *contras* destroyed 400 sq. km. of reforested coastal pine in the northeast. Areas designated for parkland have become war zones instead.

As well, the strain of heavy defence expenditures, plus repayment of the heavy debt (much of it incurred by Somoza) has meant that Nicaragua has had to cut back on some of its environmental programs.

Decision Point: The San Juan River Rainforest

1986: The Nicaraguan government grants to a Costa Rican logging firm the right to cut 3,200 sq. km. of virgin forest over the next 20 years. This logging will bring $2.5 million in foreign currency, currency desperately needed to buy spare parts, medicines and arms to fight the *contras*. Also, since the rainforest, located near the Costa Rican border, is filled with *contras*, logging will make the area much easier to defend. ABEN (the Nicaraguan Association of Biologists and Ecologists) are in vigorous opposition to this decision. They argue that the area should be made into an international biosphere reserve or "Peace Park" in coordination with Costa Rica.

STEP INTO THE SCENE:

Enact a meeting of the people involved:

- representatives of the Sandinista government—Minister of Economic Development, Minister of Health and Welfare, Minister of Defence: You value your rainforest, but you must have foreign exchange to buy basic supplies for your people, and you must get the *contras* cleared out of the rainforest area;
- representatives of ABEN: You are committed to saving the genetic diversity in your rainforest;
- a visiting American environmentalist
- a representative of the Costa Rican logging firm;
- representatives from the village of El Castillo, on the edge on the proposed timber concession area.

★ What ideas are in conflict here?
★ Can your group come up with any solutions? Any compromises?
★ Are there any other ways of achieving the desired result (foreign exchange, defence objectives, etc.) without destroying the rainforest?
★ What is the relationship between war and the environment? between foreign debt and the environment?
★ Are there any ways in which the rest of the world might be able to help you save your rainforest?

(To find out what the Nicaraguans decided, turn to page 9.)

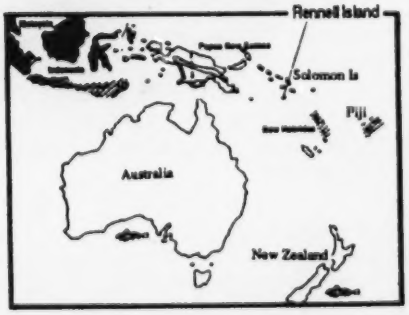
CASE-STUDY 2:

The Solomon Islands: *Finding a Development Path*

Imagine a South Pacific island, fringed with white beaches, waving palms. The interior of the island is rainforest, home to many species found nowhere else in the world. The people of the island rely on their rainforest: its vines are used for trapping fish, its poles and leaves for building homes, its trees for dugout canoes, and its leaves and herbs for medicines. The animals provide a source of protein to supplement the fruits gathered from forest trees. Suddenly, the stillness of this island is broken. There is the sound of trees snapping, of birds crying in alarm, and behind it all, the sound of a bulldozer. "Development" has arrived.

Multiply this scenario several times over, and you'll get a rough picture of what is happening in the Solomon Islands. There are 922 Solomon Islands, grouped in the southwest Pacific near Australia. The Solomons could be called the "Galapagos of the South Pacific", their forests are home to so many distinct species. Of the 163 species of land birds that breed in the Solomons, 72 species, or 44%, occur nowhere else in the world.

The rainforest of the Solomons, however, is fast diminishing. Large, multinational logging companies have moved in, and the Solomon Island forests are expected, at present rates of export, to last another 14 years. Many areas are now—after removal of the forest cover—experiencing soil erosion, silting of rivers and reefs, pollution of water supplies, and changing of weather patterns towards a drier climate. Some island people have resisted the destruction of their rainforest (see slide-tape "No Road Over Iriri Land", listed on page 10). Yet many islanders want the foreign exchange which exporting of their timber will bring them.



Decision Point: Rennell Island

Rennell Island is a small island in the Solomon group. It has 692 square kilometers of land, is the world's finest upraised coral atoll, and—apart from the small gardens cultivated by its 2,000 people—is covered with pristine rainforest. Surrounded by a coral reef and fringed with white beaches, it also contains the largest lake in the Pacific, which is dotted with tiny islands.

Because Rennell has been isolated for hundreds of years, it contains many unique species. Of approximately 50 species of birds to be found on the island, 21 are unique species or subspecies. The plants on Rennel are still mostly undescribed, but it is estimated that 15 to 20 percent of them are unique to the island.

To us, life on Rennell Island, with its abundance of fish, animal and plant life, may look idyllic, but the people of Rennell feel they would like a little more out of life. They need kerosene for lamps, water storage tanks (there are no streams on Rennell), radios, fibreglass canoes and outboard motors. In short, they need money.

A government minister has approached the Foxwood Logging Company with the suggestion that the island be logged as a way to get cash for much-needed expenditures. "We desperately need foreign exchange," he explains. "Thus the selling of our much loved land and forests which we do with broken hearts for the future."

A timber company has offered to log the rainforest of Rennell. The islanders are torn. They fear the loss of their forest, but they feel that their options for cash generation are limited. Environmentalists point out that because Rennell is a coral island with poor soil, a logging operation would permanently devastate the island and lead to disastrous ecological effects: the extinction of plant and animal species, decreased rainfall, and loss of topsoil.

STEP INTO THIS SCENE:

In a small group, enact a meeting of Rennell Islanders, as they decide their future. Make sure each of the following roles are taken:

- the pro-logging faction. Your group includes the government minister who invited the logging company. You feel that foreign exchange is more important than rainforest preservation. This exchange, you point out, is necessary for very basic necessities like medicines.
- the anti-logging faction. Your group includes "traditionalists", who set a high value on the traditional values and way of life, but also includes those who feel that other forms of cash-generation—tourism, for instance—will bring more benefit in the long term.
- the "undecideds". Some of you are unsure just how much environmental devastation will be caused by the logging. Is selective logging a possibility? Will there be jobs guaranteed for the men of your village?
- a visiting environmentalist from the World Wildlife Fund.
- a representative from the Foxwood Limited Logging Company. You want to log this island, but you feel that the operation will only make a profit if you log *all* the trees; selective logging isn't an option.

★ What ideas are in conflict here?
★ Can your group come up with any solutions? Any compromises?
★ Are there any other ways of getting the necessary foreign currency without destroying the rainforest?
★ Are there ways that the islanders themselves could develop an industry which would be sustaining on a long-term basis?
★ Are there any ways in which the rest of the world might be able to help you save your rainforest?

(For more about the current situation on Rennell Island, see page 9.)

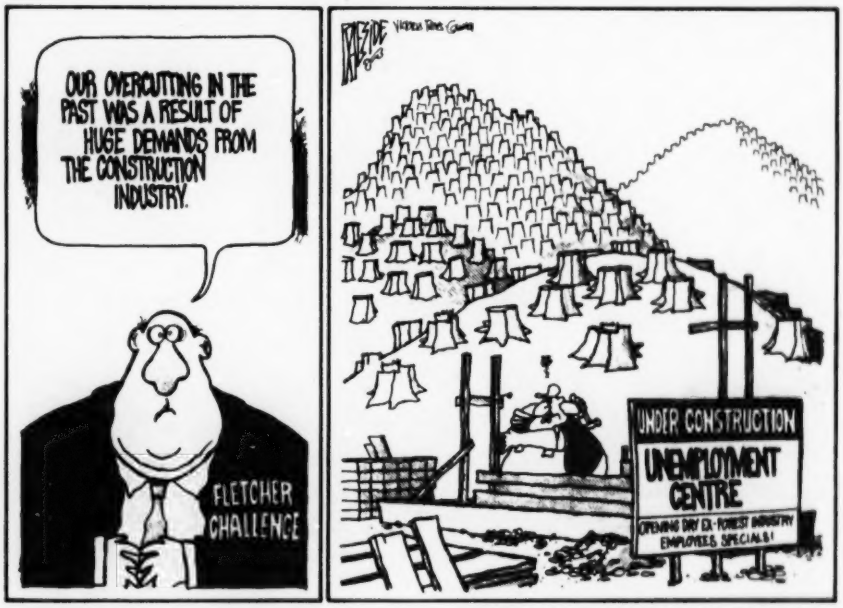
When we read in the headlines about the mass destruction of rainforest in Brazil (where in 1988 an area the size of Belgium went up in smoke) it's easy to think that the problem exists only in South America. Rennell Island and Nicaragua remind us that the struggle between rainforest exploitation and preservation is going on all over the tropics.

Meanwhile, in B.C.

"Hard statistics in the February edition of Forest Planning Canada reveal the rate at which the busy and profitable forest companies are taking our trees, particularly the oldest and best ones, as they cater to a buoyant world market for wood, pulp and paper. The total of wood cut throughout British Columbia in 1987 was about 90 million cubic metres. The government's own Forest Service estimates "long-run sustained yield," the rate at which our wood is being replaced by new growth, at 59 million cubic metres a year on lands with a currently approved allowable annual cut.

In brief, we are continuing to run up a wood deficit which will eventually lead to massive layoffs. . . ."

*("Continued overcutting costs jobs in bunches," **Times-Colonist**, February 22, 1989)*


OUR OVERCUTTING IN THE PAST WAS A RESULT OF HUGE DEMANDS FROM THE CONSTRUCTION INDUSTRY.
FLETCHER CHALLENGE
RAESIDE
UNDER CONSTRUCTION
UNEMPLOYMENT CENTRE
OPENING DAY EX-FOREST INDUSTRY EMPLOYEES SPECIALS!

(Printed by permission of A. Raeside)

Shipping out the Jobs With the Logs:

British Columbia

- logs 50% of the timber in Canada
- has 30% of the direct forest industry jobs
- produces 25% of the total value of forest products in Canada

(Sierra Club Statistics, 1988)

This cartoon, by Victoria cartoonist Raeside, expresses a point of view about the ability of large logging companies, such as the New Zealand-based multinational Fletcher Challenge, to manage B.C.'s forest industry. What problems do B.C. and developing countries face in common? (Think about job creation, reforestation, sustainability, claims of indigenous people, lack of secondary industry, conflict with other values.) What solutions can you think of for B.C.'s forest industry?

LOOKING FOR SOLUTIONS:

1 Planting Trees:

Lester Brown, of the Worldwatch Institute, urges the world reforestation of 170 million hectares of land—130 million hectares (an area slightly larger than Ethiopia) in the developing world, and 40 million hectares in the developed world. This replanting would reduce worldwide carbon emissions from all human activities by about one-quarter of current levels, and would slow the pace of warming for several decades. As well, the trees would fill local needs for fuelwood, slow erosion, and trap and recycle rainfall.

*(Brown, **State of the World 1989**)*

How to Go About It: Community Forestry

Although governments have for decades tried to promote tree planting, they have been unsuccessful. In the late 1970s, governments and development agencies began to realize that forestry projects would be successful only if the local community participated in the planning of the project, and the distribution of the benefits. Once people can see that raising seedlings will help improve their standard of living, they will get involved. The tree cutter will also become the tree planter.

Kenya: The Green Belt Movement

In 1977, the National Council of Women of Kenya set up the Green Belt Movement, which helps communities to create green belts of at least 1,000 trees on open spaces, in school grounds, along roads. There are now more than 1,000 green belts, and as many as 20,000 "mini-green belts" on farmers' fields, along with 54 community tree nurseries run by women's groups.

(Source: Harrison, ***The Greening of Africa***)

Agroforestry: combining farming with trees

Based on traditional practices from parts of Central America and Africa, where farmers have always planted trees amongst their crops, agroforestry is emerging as a new hope for farmers. Trees provide shade when needed, and at other times are pruned to provide poles for building, fodder, and mulch for fertilizer.

And on the North American scene. . .

Applied Energy Services, a Virginia-based US power company, is voluntarily helping fund a reforestation project in Guatemala in order to offset the carbon emissions resulting from a new cogeneration power station to be built in Connecticut.

(Source: Brown et. al., State of the World 1989)

2 Fuel: Cutting Down on Demand—Saving Trees

The traditional African stove consists of three stones, which support a pot over a flame. In Burkina Faso, the improved ring stove, which costs little to make and saves 35 to 70 percent on fuel, has received a boost from the government. In 1984, they trained 1,200 women to make the stoves. These women trained others, and by April 1986, 83,500 improved stoves were in use.

(Source: Harrison, The Greening of Africa)

3 Dollars for Rainforest:

Debt-for-Development Swaps

Third World Debt can sometimes be turned to advantage, as in this example:

In 1988, the World Wildlife Fund, a non-profit organization based in Washington, bought $1 million worth of Ecuadoran debt held by Bankers Trust at the discounted price of $354,500. World WildlifeFund transferred the loan payments to Fundación Natura, an Ecuadoran conservation group, which uses the money to protect and maintain national parks and wildlife preserves.

Everyone profited by this transaction. The bank was happy to be rid of the troublesome loan, on which it had given up much hope of repayment. Ecuador was happy to be able to pay off its loan in local currency, instead of using precious foreign exchange (money made on the international market, through exports). Environmentalists were happy that the rainforest would be protected.

4 Thinking Sustainably:

All of the possible solutions for deforestation can be summed up in two words: **Sustainable Development.** Sustainable development, essentially, means living off the earth's interest, without encroaching on its capital. It means investing to sustain the earth's present capital stocks of environmental resources, so that future dividends can be ensured.

Increasingly, environmentalists are being joined by economists, governments, and a host of ordinary people who feel that those who exploit the earth's resources should be required to contribute towards the environmental costs.

"There is something fundamentally wrong in treating the earth as if it were a business in liquidation." (Economist Herman Daly, quoted in ***Greenpeace***, January/Feb. 1989)

5 Getting It Together Internationally:

The world is finally realizing that rainforest destruction is a global problem. The ***Tropical Rainforest Action Plan***, developed by high-level organizations including the World Bank, is attempting to establish sustainable patterns of forest land use. (However, many environmental groups are wary that its approach is still not a sustainable one.) The ***International Tropical Timber Organization***—including representatives from tropical timber producing and consuming countries— are developing projects in reforestation and forest management.

What Can One Person Do?

If you think that's there's not much that one person can do to change the present world trend of increasing deforestation, you should meet Fletcher Khonje. Fletcher is originally from the small East African country of Malawi, but studied forestry at the University of British Columbia. As a trained African forester, Fletcher feels that he's in a good position to help inspire Africans to involve themselves in community forestry projects — planting woodlots, nurseries, applying agroforestry techniques — as well as to encourage more efficient use of fuelwood.

In March 1989, Fletcher climbed on his bicycle and began a "trek for trees" from Somalia to Senegal. For nine months, through 12 countries and over 16,000 km., Fletcher is visiting communities, sharing information about forestry practices, and gathering information for Canadian organizations which want to help. For more information about "trek for "trees", contact CFAN. (See address on page 10.)

And there's a lot that the rest of us can do, too:

1. Watch your consuming habits: Do you really need that bag, that wood product? **Particularly avoid items made from tropical hardwood.**
2. Write letters: Lobby local, provincial and federal governments for policies which promote sustainable development.
3. Raise funds for the reforestation programs sponsored by many Canadian development agencies.
4. Protect and plant trees in your area.
5. Spread the word! Educate other people about the problem.

1. Graphing Destruction:

The tropical rainforest is rapidly disappearing:

Total Areas of Tropical Rainforest (Sq. Km.)	The Americas	Africa	Asia
Original area	3.3 million	1.5 million	1.4 million
Current area	2.1 million	0.7 million	0.8 million
Projected area (2000 AD)	1.3 million	0.5 million	0.3 million

(Source: Multinational Monitor, June 1987)

Create a bar graph to show the original, current, and projected areas of tropical rainforest.

2. Fate of the Rainforest:

Everyone seems to agree that the rainforests need to be saved both as a genetic resource and as the "lungs of the world". But who should pay? Poor tropical countries like Brazil? Or the rich developed countries? Simulate an emergency conference on the fate of the rainforest. Try to come up with solutions that clearly address who should pay the price to save the rainforest, and how it should be paid. You will need to fill the following roles:

- Ministers of Forests from Nicaragua, Rennell Island, Panama, and Malaysia;
- Government officials from Canada and the U.S;
- Representatives from pharmaceutical companies;
- Representatives from a North American hamburger chain; which buys cattle from Central America;
- Representatives from the World Bank;
- Representatives from an international environment group;
- Representatives from groups of indigenous rainforest people.

3. What's all the fuss about?

In an essay, poem, or dialogue, answer the question on page one: "What's all the fuss about?", explaining the effects of deforestation. (If you submit this to your school newspaper, you may get some other folks stirred up!)

4. Economics for Sustainability:

"Your assumption that [reforestation] is a normal part of logging operations and should be costed to the logging is totally unacceptable."

(From a letter written to the Director of Forests in Papua New Guinea by the Director of the Japanese New Guinea Timber Company, part of a giant Japanese corporation)

Source: Hurst, "Forest Destruction in South East Asia," The Ecologist Vol. 17 No. 4/5 1987

How can we ensure that the use of forest resources and other resources proceeds at a sustainable rate? Several environmentalists have suggested different forms of taxation to promote sustainable development. Carbon-emitting activities, such as gasoline-use, for instance, might be taxed and the money used for forestry projects to offset the effects of CO_2 emissions. What other systems can you devise to make individuals and companies pay the cost of their environmentally unsustainable activities? Either in a small group or individually, draw up a "List of Rules and Taxes for a Sustainable Planet." (Are these rules the same for developed and undeveloped countries?)

5. The Case Studies—Drawing Conclusions; Making Links:

After reading and discussing the two case studies, pages 5 and 6, you'll probably want to know what decisions were made in Nicaragua and in Rennell Island.

The San Juan River Rainforest:

In 1987 Nicaraguan President Daniel Ortega, bowing to public pressure, cancelled the logging contract. In February 1988, Nicaragua and Costa Rica agreed to work out plans to include this land in a huge international "peace park", a protected rainforest area.

In October1988, Nicaragua received still another environmental set-back in the form of Hurricane Joan. It is estimated that 17.4 million cubic meters of wood were destroyed by the hurricane, along with countless animals. Nicaragua, a small nation of just over 3 million people, with an average per capita income of $790 US, continues to struggle towards an ideal of environmentally sustainable development and preservation of its forests.

Rennell Island:

The fate of Rennell Island is still undecided. Those who are concerned are asked by the Rainforest Action Network to write to:

The Hon. Solomon Mamaloni
Prime Minister
Parliament House
P.O. Box G19
Honiara, Solomon Islands

Rainforest Information Centre,
P.O. Box 368,
Lismore, NSW 2480
Australia

MAKING LINKS: In February and March of 1989, British Columbians participated in a series of public information meetings in eight B.C. towns and cities. The subject: B.C. forestry management. B.C. residents might have been able to get some ideas from talking to people involved in forestry decisions in Nicaragua or Rennell Island. Both of the Case Studies had some parallels to the situation in B.C. What similarities can you see? What differences? What questions might people in B.C. and abroad have to ask about: management of forests by multinational companies, alternative industries, local control of resources, the cash/cut debate?

After discussing these questions in class or in small groups, write an essay on the topic:

"B.C. and the Third World — Some Shared Forestry Questions and Answers"

RESOURCES

Audio-Visuals:

Acid Rain: Requiem or Recovery (NFB 106C 0181 527, 27 min.): This award-winning film examines the impact of acid rain on Canadian lakes, forests and wildlife.

B.C. Ministry of Forests films and videos available from L.M. Media Marketing Services Ltd., 15161 Fraser Hwy, Surrey, B.C. V3R 3P2 (588-2214). Rental $15.

Carmanah Forever (VHS, 1988, 25 min.) Narrated by David Suzuki, covers information on B.C. forestry and Carmanah past and present. For sale from Western Canada Wilderness Committee (address below) for $12.

Environment Under Fire: Ecology and Politics in Central America (27 min. video)Shows the devastating impact of militarization, land ownership and multinationals on the Central American ecology. Rental $5 from Tools for Peace (address below).

The Forest in Crisis (NFB 106C 0181 910, 21 min.): Documents the use and misuse of forest resources in northern Ontario and the efforts of government and industry to find better ways to grow a second forest.

The Fragile Mountain (NFB 106C 0182 123, 55 min.): On effects of deforestation in Nepal.

No Road Over Iriri Land (slide-tape show, 1980, 23 min.): Highlights 2 contrasting approaches—local development and export-led development—on the Solomon Islands. Rental $15.00 plus return shipping from South Pacific Peoples Foundation (address below).

Roots of Famine (15 min. slide-set, MCC, 1986): Land abuse as the reason for famine in Ethiopia. Reminds North Americans not to take their environment for granted. Available for cost of return postage from Mennonite Central Committee (address below).

Trees of Hope (NFB 106C 0185 093, 18 min.): Problem of deforestation in Africa, and the relationship between trees, drought, and environmental degradation .

Trees of Plenty (NFB 106C 0186 134, 20 min.): Efforts in Nepal, Costa Rica and Nigeria to combat deforestation and erosion by agroforestry.

Teaching Kits:

Tropical Rainforest Action Kit
Text, teachers' guide, and 15 min. slide-show will be available September 1989, for approximately $45. Contact Friends of the Earth, Suite 701, 251 Laurier Ave. W. Ottawa, Ontario K1P 5J6 (613) 230-3352.

Brundtland Kit
A simplified, condensed treatment of "Our Common Future", the Brundtland Report on Environment and Development. Those schools which have had the UNA's "Africa 2000" presentation in their school will already have received it (ask the head of your Social Studies department). United Nations, Vancouver Branch (address below). Donations accepted.

Organizations:

The following B.C. organizations all offer additional resources — print, audio-visual, speakers — on forestry and sustainable development issues. The starred organizations support overseas development projects relating to forestry:

B.C. Environmental Network
Box 224
New Denver, B.C. V0G 1S0
1-800-663-7827 (toll-free)
Speakers and information on B.C. environmental issues for communities all over B.C.

★ CFAN: Community Forestry for Africa Network
#206 - 111 West Broadway (at Manitoba),
Vancouver, B.C. V5Y 1P4
874-CFAN

★ CUSO
2524 Cypress Street
Vancouver, B.C. V6J 3N2
732-1814

★ Delta Foundation
P.O. Box 1118
Delta, B.C. V4M 3T2
943-6337

East Timor Alert Network
Box 354
Ladysmith, B.C. V0R 2E0
245-3068

Global Village (Nanaimo)
101 - 259 Pine Street,
Nanaimo, B.C. V9R 2B7
753-3322

★ Hope International Development Agency
210 - 6th Street
New Westminster, B.C. V3L 3A2
525-5481

IDERA
2524 Cypress Street
Vancouver, B.C. V6J 3N2
738-8815 (AV rental)
732-1496 (other)
Excellent films and videos on sustainable development

Kootenay Centre For a Sustainable Future
Box 727
Nelson, B.C. V1L 5R4
354-4035

★ Mennonite Central Committee
P.O. Box 2038
Clearbrook, B.C. V2T 3T8
850-6639 / 533-0035

Northwest Development Education
Box 207
Terrace, B.C. V8G 4A6
635-2436

★ OXFAM Canada
2524 Cypress Street
Vancouver, B.C. V6J 3N2
736-7678

★ OXFAM Canada - Vancouver Island Outreach Project
205 - 620 View Street
Victoria, B.C. V8W 1J6
381-5226

Sierra Club of Western Canada
314 - 620 View Street,
Victoria, B.C. V8W 1J6
386-5255

South Pacific Peoples Foundation
409-620 View Street
Victoria, B.C. V8W 1J6
381-4131

Tools for Peace
1672 East 10th Avenue
Vancouver, B.C. V5N 1X5
879-7216

United Nations Association (Vancouver)
Suite #210 - 1956 W. Broadway
Vancouver, B.C. V6J 1Z2
733-3912

United Nations Association (Victoria)
218 - 835 Humboldt Street
Victoria, B.C. V8V 4W8
383-4635

VIDEA
407 - 620 View Street
Victoria, B.C. V8W 1J6
385-2333

Western Canada Wilderness Committee
20 Water Street
Vancouver, B.C. V6B 1A4
731-6716
In Victoria: 370-5144

Teachergram

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